

WHAT IS CLAIMED IS:

1. A wiring board comprising:

a wiring laminate portion including dielectric layers containing a polymeric material and conductor layers laminated alternately so as to form a first main surface out of one of said dielectric layers; and

5 a plurality of metal terminal pads disposed on said first main surface,

wherein:

10 each of said metal terminal pads has a structure in which a Cu-plated layer is disposed on a side of said first main surface and an Au-plated layer is disposed in an outermost surface layer portion of said metal terminal pad, while an electroless Ni-plated layer having a P content not higher than 15 3% by weight is disposed as a barrier metal layer between said Cu-plated layer and said Au-plated layer.

2. A wiring board comprising:

a wiring laminate portion including dielectric layers containing a polymeric material and conductor layers laminated alternately so as to form a first main surface out of one of said dielectric layers; and

20 a plurality of metal terminal pads disposed on said first main surface,

25 wherein:

each of said metal terminal pads has a structure in which  
a layer containing Cu is disposed on a side of said first main  
surface and a layer containing Au is disposed in an outermost  
surface layer portion of said metal terminal pad, while a layer  
5 containing Ni which has a P content not higher than 3% by weight  
is disposed as a barrier metal layer between said layer  
containing Cu and said layer containing Au layer.

3. The wiring board according to claim 1, wherein said  
10 electroless Ni-plated layer is an Ni-B-based electroless  
Ni-plated layer.

4. The wiring board according to claim 1, wherein said  
electroless Ni-plated layer is in direct contact with said  
15 Au-plated layer, and said Au-plated layer is made of an  
electroless reduction Au-plated layer.

5. The wiring board according to claim 1, wherein said  
electroless Ni-plated layer has a thickness of from 2 to 7  $\mu\text{m}$   
20 and the Au-plated layer has a thickness of from 0.03 to 0.1  
 $\mu\text{m}$ .

6. A wiring board comprising:  
a wiring laminate portion including dielectric layers  
25 containing a polymeric material and conductor layers laminated

alternately so as to form a first main surface out of one of said dielectric layers; and

a plurality of metal terminal pads disposed on said first main surface;

5 wherein:

each of said metal terminal pads has a structure in which a Cu-plated layer is disposed on a side of said first main surface and an Au-plated layer is disposed in an outermost surface layer portion of said metal terminal pad, while a 10 platinum-metal-based electroless plated layer is disposed as a barrier metal layer between said Cu-plated layer and said Au-plated layer.

7. A wiring board comprising:

15 a wiring laminate portion including dielectric layers containing a polymeric material and conductor layers laminated alternately so as to form a first main surface out of one of said dielectric layers; and

20 a plurality of metal terminal pads disposed on said first main surface;

wherein:

each of said metal terminal pads has a structure in which a layer containing Cu is disposed on a side of said first main surface and a layer containing Au is disposed in an outermost 25 surface layer portion of said metal terminal pad, while a layer

containing platinum-metal is disposed as a barrier metal layer between said layer containing Cu and said layer containing Au.

8. The wiring board according to claim 6, wherein said 5 platinum-metal-based electroless plated layer is an electroless Pd-plated layer.

9. The wiring board according to claim 6, wherein said 10 platinum-metal-based electroless plated layer is an electroless Ir-plated layer, an electroless Pt-plated layer, an electroless Rh-plated layer or an electroless Ru-plated layer.

10. The wiring board according to claim 6, wherein said 15 platinum-metal-based electroless plated layer has a thickness of 0.05-1  $\mu$ m.

11. A wiring board comprising:  
a wiring laminate portion including dielectric layers 20 containing a polymeric material and conductor layers laminated alternately so as to form a first main surface out of one of said dielectric layers; and  
a plurality of metal terminal pads disposed on said first main surface,

25 wherein:

each of said metal terminal pads has a structure in which a Cu-plated layer is disposed on a side of said first main surface and an Au-plated layer is disposed in an outermost surface layer portion of said metal terminal pad, while an 5 Ni-P-based electroless Ni-plated layer in contact with said Cu-plated layer and a P-barrier electroless metal plated layer for blocking or suppressing P-diffusion from said Ni-P-based electroless Ni-plated layer to said Au-plated layer are disposed as barrier metal layers between said Cu-plated layer 10 and said Au-plated layer, said P-barrier electroless metal plated layer being disposed between said Ni-P-based electroless Ni-plated layer and said Au-plated layer.

12. A wiring board comprising:

15 a wiring laminate portion including dielectric layers containing a polymeric material and conductor layers laminated alternately so as to form a first main surface out of one of said dielectric layers; and  
a plurality of metal terminal pads disposed on said first 20 main surface,

wherein:

each of said metal terminal pads has a structure in which a layer containing Cu is disposed on a side of said first main surface and a layer containing Au is disposed in an outermost 25 surface layer portion of said metal terminal pad, while a layer

containing Ni and P in contact with said layer containing Cu and a layer containing Ni and B are disposed as barrier metal layers between said layer containing Cu and said layer containing Au, said layer containing Ni and B being disposed between said 5 layer containing Ni and P and said layer containing Au.

13. The wiring board according to claim 11, wherein said P-barrier electroless metal plated layer is an Ni-B-based electroless Ni-plated layer.

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14. The wiring board according to claim 11, wherein said P-barrier electroless metal plated layer is a platinum-metal-based electroless plated layer.

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15. The wiring board according to claim 11, wherein said Au-plated layer is made of an electroless reduction Au-plated layer.

16. The wiring board according to claim 11, wherein said 20 Ni-P-based electroless Ni-plated layer has a thickness of from 2 to 7  $\mu\text{m}$ , and said P-barrier electroless metal plated layer has a thickness of from 0.05 to 2  $\mu\text{m}$ .

17. A wiring board comprising:  
25 a wiring laminate portion including dielectric layers

containing a polymeric material and conductor layers laminated alternately so as to form a first main surface out of one of said dielectric layers; and

5 a plurality of metal terminal pads disposed on said first main surface,

wherein:

each of said metal terminal pads has a structure in which a Cu-plated layer is disposed on a side of said first main surface, and an Au-plated layer is disposed in an outermost 10 surface layer portion of said metal terminal pad, while an Ni-B-based electroless Ni-plated layer in contact with said Cu-plated layer and an Ni-P-based electroless metal plated layer thinner than said Ni-B-based electroless Ni-plated layer are disposed as barrier metal layers between said Cu-plated 15 layer and said Au-plated layer, said Ni-P-based electroless metal plated layer being disposed between said Ni-B-based electroless Ni-plated layer and said Au-plated layer.

18. A wiring board comprising:

20 a wiring laminate portion including dielectric layers containing a polymeric material and conductor layers laminated alternately so as to form a first main surface out of one of said dielectric layers; and

25 a plurality of metal terminal pads disposed on said first main surface,

wherein:

each of said metal terminal pads has a structure in which  
a layer containing Cu is disposed on a side of said first main  
surface, and a layer containing Au is disposed in an outermost  
5 surface layer portion of said metal terminal pad, while a layer  
containing Ni and B in contact with said layer containing Cu  
and a layer containing Ni and P thinner than said layer containing  
Ni and B are disposed as barrier metal layers between said layer  
containing Cu and said layer containing Au, said layer containing  
10 Ni and P being disposed between said layer containing Ni and  
B and said layer containing Au.

19. The wiring board according to claim 17, wherein said  
Ni-P-based electroless metal plated layer is not thicker than  
15 2  $\mu$ m.

20. The wiring board according to Claim 17, wherein said  
Au-plated layer is made of an electroless reduction Au-plated  
layer.

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21. The wiring board according to Claim 17, wherein said  
Ni-B-based electroless Ni-plated layer has a thickness of from  
2 to 7  $\mu$ m, and said Ni-P-based electroless metal plated layer  
has a thickness of from 0.05 to 2  $\mu$ m

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22. A wiring board with solder members, which comprises:  
the wiring board according to claim 1; and solder balls so that  
said metal terminal pads are to be connected to  
mother-board-side terminal pads through said solder balls  
5 respectively, wherein said solder balls contains an Sn alloy  
whose liquidus temperature is not lower than 200°C.

23. The wiring board with solder members according to  
claim 22, wherein said solder balls are bonded directly to said  
10 metal terminal pads respectively.

24. The wiring board with solder members according to  
Claim 23, wherein said solder balls contain one of an  
Sn-Ag-based alloy and an Sn-Cu alloy.

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25. The wiring board with solder members according to  
Claim 23, wherein said solder balls contain an Sn alloy having  
a Pb content not higher than 5% by mass.

20 26. A wiring board with solder members, which comprises:  
the wiring board according to claim 6; and solder balls so that  
said metal terminal pads are to be connected to  
mother-board-side terminal pads through said solder balls  
respectively, wherein said solder balls contains an Sn alloy  
25 whose liquidus temperature is not lower than 200°C.

27. The wiring board with solder members according to claim 26, wherein said solder balls are bonded directly to said metal terminal pads respectively.

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28. The wiring board with solder members according to claim 27, wherein said solder balls contain one of an Sn-Ag-based alloy and an Sn-Cu alloy.

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29. The wiring board with solder members according to claim 27, wherein said solder balls contain an Sn alloy having a Pb content not higher than 5% by mass.

30. A wiring board with solder members, which comprises:  
15 the wiring board according to claim 11; and solder balls so that said metal terminal pads are to be connected to mother-board-side terminal pads through said solder balls respectively, wherein said solder balls contains an Sn alloy whose liquidus temperature is not lower than 200°C.

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31. The wiring board with solder members according to claim 30, wherein said solder balls are bonded directly to said metal terminal pads respectively.

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32. The wiring board with solder members according to

claim 31, wherein said solder balls contain one of an Sn-Ag-based alloy and an Sn-Cu alloy.

33. The wiring board with solder members according to  
5 claim 31, wherein said solder balls contain an Sn alloy having  
a Pb content not higher than 5% by mass.

34. A wiring board with solder members, which comprises:  
the wiring board according to claim 17; and solder balls so  
10 that said metal terminal pads are to be connected to  
mother-board-side terminal pads through said solder balls  
respectively, wherein said solder balls contains an Sn alloy  
whose liquidus temperature is not lower than 200°C.

15 35. The wiring board with solder members according to  
claim 34, wherein said solder balls are bonded directly to said  
metal terminal pads respectively.

36. The wiring board with solder members according to  
20 claim 35, wherein said solder balls contain one of an  
Sn-Ag-based alloy and an Sn-Cu alloy.

37. The wiring board with solder members according to  
claim 35, wherein said solder balls contain an Sn alloy having  
25 a Pb content not higher than 5% by mass.